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ICC Staff Exhibit 4.0

DIRECT TESTIMONY

of

MICHAEL McNALLY

FINANCE DEPARTMENT

FINANCIAL ANALYSIS DIVISION

ILLINOIS COMMERCE COMMISSION

Cherry Hill Water Company

Docket No. 03-0401

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WITNESS IDENTIFICATION

Q. Please state your name and business address.

A. My name is Michael McNally. My business address is 527 East Capitol Avenue, Springfield, IL 62701.

Q. What is your current position with the Illinois Commerce Commission ("Commission")?

A. I am presently a Senior Financial Analyst in the Finance Department of the Financial Analysis Division.

Q. Please describe your qualifications and background.

A. In May of 1993, I received a Bachelor of Arts degree in Economics from the University of Illinois at Urbana-Champaign. In May of 1999, I received a Master of Business Administration degree, with a concentration in Finance, from the University of Illinois at Urbana-Champaign. I have been employed by the Commission since June 1999. I was promoted to Senior Financial Analyst in April of 2002.

Q. Please state the purpose of your testimony in this proceeding.

A. The purpose of my testimony is to present my analysis of the cost of capital of, and recommend an overall rate of return for Cherry Hill Water Company (the "Company").

COST OF CAPITAL

Q. Please summarize your cost of capital findings.

A. The overall cost of capital for the Company equals 8.49%, as shown on Schedule 4.1.

Q. Please define the overall cost of capital for a public utility.

A. The overall cost of capital equals the sum of the component costs of the capital structure (i.e., debt, preferred stock, and common equity) after each is weighted by its proportion to total capital. It represents the rate of return the utility needs to earn on its assets to satisfy contractual obligations to, or the market requirements of, its investors.

Q. Why must one determine an overall cost of capital for a public utility?

A. A primary goal of regulation is to properly balance the interests of a utility's ratepayers and investors. This is accomplished by minimizing the cost of reliable service to ratepayers while allowing utilities to earn a fair and reasonable rate of return on rate base.

Regulators should authorize a rate of return for public utilities that equals the investor-required rate of return for companies with similar risk characteristics. When public utilities charge rates that reflect an authorized rate of return that exceeds the cost of capital, customers are encumbered with excessive prices. Conversely, when public utilities charge rates that reflect an authorized rate of return below the cost of capital, the financial integrity of the utility suffers, making it difficult for the utility to attract capital at a reasonable cost. Ultimately, the utility's inability to

raise sufficient capital would impair service quality. Customers are best served when the authorized rate of return on rate base equals the overall cost of capital.

In authorizing a rate of return on rate base equal to the overall cost of capital, all costs of service are assumed reasonable and accurately measured. If unreasonable costs continue to be incurred, or if any reasonable cost of service component is measured inaccurately, then the authorized rate of return on rate base will not balance ratepayer and investor interests.

Capital Structure

Q. What capital structure did the Company propose for setting rates?

A. The Company proposes using Utilities, Inc.'s ("UI") December 31, 2002 capital structure, comprising 59.76% long-term debt and 40.24% common equity.[1] The Company's proposed capital structure appears on Schedule 4.1.

Q. What capital structure do you recommend?

A. The Company is a 100% equity financed, wholly owned subsidiary of UI.[2] Thus, the financial risk of the Company is essentially the financial risk of UI, and adopting UI's capital structure is appropriate. I recommend adopting a December 31, 2002, capital structure comprising 59.79% long-term debt and 40.21% common equity, as shown on Schedule 4.1.

[1] Company response to Staff data request MGM 2.01.
[2] Company response to Staff data request MGM 2.02.

Q. Did you include short-term debt in the Company's capital structure?

A. No. The Company only carried a monthly ending balance of total short-term debt during two months from June 2002 through June 2003.[3] Thus, short-term debt did not play a continual role in the financing of the Company's rate base during the months surrounding the Company's chosen capital structure measurement date and should not be included in its capital structure.

Q. Please describe the adjustments you made to the Company's proposed long-term debt balance.

A. I made two adjustments to the Company's long-term debt balance. First, I included current maturities in the calculation of the face amount outstanding. Second, I used the "carrying value" of UI's outstanding long-term debt, as shown on Schedule 4.2, for the long-term debt balance presented on Schedule 4.1. Carrying value equals the face amount outstanding less the unamortized debt expense.[4] The carrying value of total long-term debt should be used because it reflects the total net proceeds available for investment. The Company incorrectly used the face amount outstanding as of December 31, 2002 less current maturities.[5]

Q. Does capital structure affect the overall cost of capital?

A. Yes. Capital structure affects the value of a firm and, therefore, its cost of capital, to the extent it affects the expected level of cash flows that accrue to third parties (i.e., other than debt and stock holders). Employing debt as a source of capital reduces

[3] Company response to Staff data request MGM 1.07.

[4] Debt expense represents the costs a utility incurred to issue debt. The unamortized balance of debt expense represents the portion of that cost a utility has not yet had an opportunity to recover.

[5] Company response to Staff data request MGM 1.02 and Company work paper W/P [h-1].

a company's income taxes,[6] thereby reducing the cost of capital; however, as reliance on debt as a source of capital increases, so does the probability of bankruptcy. As bankruptcy becomes more probable, expected payments to attorneys, trustees, accountants and other third parties increase. Simultaneously, the expected value of the income tax shield provided by debt financing declines. Beyond a certain point, a growing dependence on debt as a source of funds increases the overall cost of capital. Therefore, the Commission should not determine the overall rate of return from a utility's actual capital structure if the Commission concludes that capital structure adversely affects the overall cost of capital.

An optimal capital structure would minimize the cost of capital and maintain a utility's financial integrity. Unfortunately, determining whether a capital structure is optimal remains problematic because (1) the cost of capital is a continuous function of the capital structure, rendering its precise measurement along each segment of the range of possible capital structures problematic; (2) the optimal capital structure is a function of operating risk, which is dynamic; and (3) the relative costs of the different types of capital vary with dynamic market conditions. Consequently, one should determine whether the capital structure is consistent with the financial strength necessary to access the capital markets under most if not all economic conditions, and if so, whether the cost of that financial strength is reasonable.

[6] The tax advantage debt has over equity at the corporate level is partially offset at the individual investor level. Debt investors receive returns largely in the form of current income (i.e., interest). In contrast, equity investors receive returns in the form of both current income (i.e., dividends) and capital appreciation (i.e., capital gains). Taxes on dividends and capital gains are lower than taxes on interest income because dividends and capital gains tax rates are lower and taxes on capital gains are deferred until realized.

Towards that end, I compared the Company's December 31, 2002 capital structure[7] to utility industry benchmarks. Standard & Poor's ("S&P") categorizes debt securities on the basis of the risk that a company will default on its interest or principal payment obligations. The resulting credit rating reflects both the operating and financial risks of a utility.[8] Although no formula exists for determining a credit rating, S&P publishes utility target values, by business profile score, for four financial ratios it includes in its credit ratings analyses, including the total debt ratio. According to S&P, BBB-rated utilities with a business profile score of 3 should have a total debt to total capital ratio between 53.0% and 61.0%.[9] The Company's December 31, 2002 total debt ratio was 59.79%, which is within the target range for a BBB rating. Thus, the Company's capital structure is reasonable for rate-making purposes.

Q. Why did you compare the Company's December 31, 2002 total debt ratio to the published S&P targets for utilities with a business profile score of 3?

A. A firm's market-required return on common equity is a function of its operating and financial risks. S&P business profile scores reflect the operating risk of a utility. S&P focuses on industry characteristics as well as the company's competitive position and management. A utility's business profile is evaluated on a scale of one to ten. A rating of one denotes below average business risk, while a rating of ten denotes above average business risk.[10] I imputed an S&P business profile score for the Company, since it does not have one. I began with twelve market-traded water/sewer companies with S&P business profile scores listed in S&P *Utilities &*

[7] This capital structure reflects the adjustment to the Company's proposed long-term debt balance noted previously.

[8] Standard & Poor's Utilities Rating Service: Industry Commentary, May 20, 1996, p. 1.

[9] Standard & Poor's, "Utilities Financial Targets are Revised," June 18, 1999.

[10] Standard & Poor's, *Corporate Ratings Criteria 2002,* www.standardandpoors.com/ratings, p. 17.

Perspectives. The average business profile score of the twelve water/sewer utilities is 2.75. From that average business profile score, I concluded that a business profile score of 3 would be a reasonable estimate for the Company.

Q. Why did you compare the Company's December 31, 2002 total debt ratio to the published S&P targets for BBB-rated companies?

A. As noted previously, the Company is a 100% equity financed, wholly owned subsidiary of UI. Since the Company is wholly dependent on UI for external capital, the financial risk of the Company is essentially the financial risk of UI. Therefore, I estimated a credit rating based on data from UI's financial statements. The financial ratios I calculated indicate that UI's financial strength is commensurate with a strong BBB rating.

Q. Did you adjust any of the data in UI's financial statements before calculating the financial ratios?

A. Yes. I adjusted the tax expense and the operating and net income to remove the effects of merger expenses UI recorded on its financial statements. UI recorded merger expenses of almost $10 million per year during 2001 and 2002. However, the Company has indicated that it does not expect to continue to incur such merger expenses.[11] The inclusion of those non-recurring merger expenses results in financial ratios that understate UI's true financial strength. Thus, the effects of those merger expenses should be removed to accurately reflect UI's financial outlook.

[11] Company response to Staff data request MGM 3.04.

Q. Please describe the ratio analysis that led you to conclude that UI's financial strength is consistent with a strong BBB corporate credit rating.

A. S&P publishes targets for the following four financial ratios (collectively, the "Benchmark Ratios") that it uses in its analysis of investor-owned utilities: (1) funds from operations ("FFO") to total debt; (2) FFO interest coverage; (3) pre-tax interest coverage; and (4) total debt to total capital.[12] The Benchmark Ratios measure financial risk. The financial targets vary with the business profile score. The S&P published targets for utilities with business profile scores of 3 indicate that UI's financial strength is consistent with a strong BBB corporate credit rating. Table 1 presents UI's financial ratios for 2002 and the 2000-2002 period average.

Table 1:
S&P Utility Benchmark Credit Ratio Analysis

Financial Ratio	Utilities, Inc. 2002	Utilities, Inc. 3-year average	S&P Target Range BBB-rated utilities with a business profile score of 3	S&P Target Range A-rated utilities with a business profile score of 3
FFO to Total Debt	12.7%	14.2%	14.0% – 20.0%	20.0% – 26.0%
FFO Interest Coverage	2.9x	3.0x	2.1x – 3.1x	3.1x – 3.9x
Pretax Interest Coverage	2.3x	2.8x	1.8x – 2.8x	2.8x – 3.4x
Total Debt to Total Capital	60.3%	56.4%	53.0% – 61.0%	47.5% – 53.0%

[12] Standard & Poor's, "Utility Financial Targets are Revised," June 18, 1999.

Cost of Long-term Debt

Q. Please describe the adjustments you made to the Company's proposed embedded cost of long-term debt.

A. I made the following adjustments to the Company's proposed embedded cost of long-term debt: (1) the coupon interest expense for the four outstanding promissory notes was adjusted to reflect their interest rates multiplied by their respective face amounts outstanding and (2) the annual amortization of debt expense was adjusted to reflect straight-line amortization of each issue's December 31, 2002 unamortized debt expense balance over its remaining life.

Q. What is the Company's embedded cost of long-term debt?

A. As of December 31, 2002, the Company's embedded cost of long-term debt was 7.50%, as shown on Schedule 4.2.

Cost of Common Equity

Q. What is the Company's cost of common equity?

A. My analysis indicates that the Company's cost of common equity is 9.97%.

Q. How did you measure the investor-required rate of return on common equity for the Company?

A. I measured the investor-required rate of return on common equity for the Company with discounted cash flow ("DCF") and risk premium models. Since the Company does not have market-traded common stock, DCF and risk premium models cannot be applied directly to the Company; therefore, I applied both models to a sample of

nine public utilities ("Utility Sample") and a sample of seven water companies ("Water Sample") comparable in risk to the Company.

Sample Selection

Q. How did you select the Utility Sample?

To form the Utility Sample, I selected all domestic electric and gas distribution utilities listed in the S&P *Utility Compustat II* database with credit ratings from A to BBB and business profile scores of 3. Further, I eliminated any limited liability companies because of their corporate income tax-free status. The nine public utilities meeting those criteria compose the Utility Sample and are presented on Schedule 4.3.

Q. How did you select the Water Sample?

A. For my Water Sample, I included all domestic water companies for which I had sufficient data to conduct DCF and risk premium analyses that are not being acquired by another company. Schedule 4.3 presents the seven water utilities composing the Water Sample.

DCF Analysis

Q. Please describe DCF analysis.

A. For a utility to attract common equity capital, it must provide a rate of return on common equity sufficient to meet investor requirements. DCF analysis establishes a rate of return directly from investor requirements. Implementation of a DCF analysis does not require a comprehensive analysis of a utility's operating and

196 financial risks since the market price of a utility's stock already embodies the
197 market consensus of those risks.

198 According to DCF theory, a security price equals the present value of the cash flow
199 investors expect it to generate. Specifically, the market value of common stock
200 equals the cumulative value of the expected stream of future dividends after each is
201 discounted by the investor-required rate of return.

202 **Q. Please describe the DCF model with which you measured the investor-**
203 **required rate of return on common equity.**
204 A. As it applies to common stocks, DCF analysis is generally employed to determine
205 appropriate stock prices given a specified discount rate. Since a DCF model
206 incorporates time-sensitive valuation factors, it must correctly reflect the timing of
207 the dividend payments that stock prices embody. As such, incorporating stock
208 prices that the financial market sets on the basis of quarterly dividend payments into
209 a model that ignores the time value of quarterly cash flows constitutes a
210 misapplication of DCF analysis.

211 The companies in both samples pay dividends quarterly; therefore, I applied a
212 constant-growth DCF model that measures the annual required rate of return on
213 common equity as follows:

214
$$k = \frac{\sum_{q=1}^{4} D_{0,q}(1+g)(1+k)^{1-[x+0.25(q-1)]}}{P} + g.$$

where P ≡ the current stock price;

$D_{0,q}$ ≡ the last dividend paid at the end of quarter q, where q = 1 to 4;

k ≡ the cost of common equity;

x ≡ the elapsed time between the stock observation and first dividend payment dates, in years; and

g ≡ the expected dividend growth rate.

The expression $(1 + k_e)^{1-[x+0.25(q-1)]}$ is a future value factor that measures the value of the expected dividend ($D_{0,q}(1 + g)$) one year from the stock price measurement date. The DCF model above assumes dividends will grow at a constant rate, and the market value of common stock (i.e., stock price) equals the sum of the discounted value of each dividend.

Q. How did you estimate the growth rate parameter?

A. Determining the market-required rate of return with the DCF methodology requires a growth rate that reflects the expectations of investors. Although the current market price reflects aggregate investor expectations, market-consensus expected growth rates cannot be observed directly. Therefore, I measured market-consensus expected growth indirectly with growth rates forecasted by securities analysts that are disseminated to investors.

IBES and Zacks summarize and publish the earnings growth expectations of financial analysts employed by the research departments of investment brokerage firms. Both provide forward-looking, expectational estimates of earnings growth. Therefore, I averaged the IBES and Zacks growth rate estimates to measure market-consensus expected growth. Schedule 4.3 presents the analysts' growth rate estimates for the companies in the Utility Sample and the Water Sample.

Q. How did you measure the stock price?

A. A current stock price reflects all information that is available and relevant to the market; thus, it represents the market's assessment of the common stock's current value. I measured each company's current stock price with its closing market price from August 20, 2003. Those stock prices appear on Schedule 4.4.

Since current stock prices reflect the market's current expectation of the cash flows the securities will produce and the rate at which those cash flows are discounted, an observed change in the market price does not necessarily indicate a change in the required rate of return on common equity. Rather, a price change may reflect investors' re-evaluation of the expected dividend growth rate. In addition, stock prices change with the approach of dividend payment dates. Consequently, when estimating the required return on common equity with the DCF model, one should measure the expected dividend yield and the corresponding expected growth rate concurrently. Using an historical stock price along with current growth expectations or combining an updated stock price with past growth expectations will likely produce an inaccurate estimate of the market-required rate of return on common equity.

Q. Please explain the significance of the column titled "Next Dividend Payment Date" shown on Schedule 4.4.

A. Estimating year-end dividend values requires measuring the length of time between each dividend payment date and the first anniversary of the stock observation date. For the first dividend payment, that length of time is measured from the "Next Dividend Payment Date." Subsequent dividend payments occur in quarterly intervals.

Q. How did you estimate the next four expected quarterly dividends?

A. Most utilities declare and pay the same dividend per share for four consecutive quarters before adjusting the rate. Consequently, I assumed the dividend rate will adjust during the same quarter it changed during the preceding year. If the utility did not change its dividend during the last year, I assumed the rate would change during the next quarter. The average expected growth rate was applied to the current dividend rate to estimate the expected dividend rate.[13] Schedule 4.4 presents the current quarterly dividends. Schedule 4.5 presents the expected quarterly dividends.

Q. Based on your DCF analysis, what are the estimated required rates of return on common equity for the Utility Sample and the Water Sample?

A. The DCF analysis estimated a required rate of return on common equity of 9.68% for the Utility Sample and 10.02% for the Water Sample, as shown on Schedule 4.6. Those results represent averages of the DCF estimates for the individual companies in the two samples,[14] which are derived from the growth rates presented on Schedule 4.3, the stock price and dividend payment dates presented on Schedule 4.4, and the expected quarterly dividends presented on Schedule 4.5.

[13] Unless the next dividend has already been declared and differed from that indicated by this methodology, in which case, the declared dividend value was entered. This was the case for Philadelphia Suburban, Laclede Group, and NUI Corp.

[14] With the exception of American States Water Company, whose 6.50% DCF estimate was discarded from the Water Sample average. The Water Sample had no extreme high-end individual DCF results to counterbalance the extremely low results for American States Water Company.

Risk Premium Analysis

Q. Please describe the risk premium model.

A. The risk premium model is based on the theory that the market-required rate of return for a given security equals the risk-free rate of return plus a risk premium associated with that security. A risk premium represents the additional return investors expect in exchange for assuming the risk inherent in an investment. Mathematically, a risk premium equals the difference between the expected rate of return on a risk factor and the risk-free rate. If the risk of a security is measured relative to a portfolio, then multiplying that relative measure of risk and the portfolio's risk premium produces a security-specific risk premium for that risk factor.

The risk premium methodology is consistent with the theory that investors are risk-averse. That is, investors require higher returns to accept greater exposure to risk. Thus, if investors had an opportunity to purchase one of two securities with equal expected returns, they would purchase the security with less risk. Conversely, if investors had an opportunity to purchase one of two securities with equal risk, they would purchase the security with the higher expected return. In equilibrium, two securities with equal quantities of risk have equal required rates of return.

The Capital Asset Pricing Model ("CAPM") is a one-factor risk premium model that mathematically depicts the relationship between risk and return as:

$$R_j = R_f + \beta_j \times (R_m - R_f)$$

where R_j ≡ the required rate of return for security j;

R_f ≡ the risk-free rate;

R_m ≡ the expected rate of return for the market portfolio; and

β_j ≡ the measure of market risk for security j.

In the CAPM, the risk factor is market risk, which is defined as risk that cannot be eliminated through portfolio diversification. To implement the CAPM, one must estimate the risk-free rate of return, the expected rate of return on the market portfolio, and a security or portfolio-specific measure of market risk.

Q. How did you estimate the risk-free rate of return?

A. I examined the suitability of the yields on three-month U.S. Treasury bills and thirty-year U.S. Treasury bonds as estimates of the risk-free rate of return.

Q. Why did you examine the yields on U.S. Treasury bills and bonds as measures of the risk-free rate?

A. The proxy for the nominal risk-free rate should contain no risk premium and reflect similar inflation and real risk-free rate expectations to the security being analyzed through the risk premium methodology.[15] The yields of fixed income securities include premiums for default and interest rate risk. Default risk pertains to the possibility of default on principal or interest payments. Securities of the United States Treasury are virtually free of default risk by virtue of the federal government's fiscal and monetary authority. Interest rate risk pertains to the effect of unexpected interest rate fluctuations on the value of securities.

[15] Real risk-free rate and inflation expectations comprise the non-risk related portion of a security's rate of return.

Since common equity theoretically has an infinite life, its market-required rate of return reflects the inflation and real risk-free rates anticipated to prevail over the long run. U.S. Treasury bonds, the longest term treasury securities, were issued with terms to maturity of thirty years;[16] U.S. Treasury notes are issued with terms to maturity ranging from two to ten years; U.S. Treasury bills are issued with terms to maturity ranging from four to twenty-six weeks. Therefore, U.S. Treasury bonds are more likely to incorporate within their yields the inflation and real risk-free rate expectations that drive, in part, the prices of common stocks than either U.S. Treasury notes or Treasury bills.

However, due to relatively long terms to maturity, U.S. Treasury bond yields also contain an interest rate risk premium that diminishes their usefulness as measures of the risk-free rate. U.S. Treasury bill yields contain a smaller premium for interest rate risk. Thus, in terms of interest rate risk, U.S. Treasury bill yields more accurately measure the risk-free rate.

Q. Given the similarity in the inflation and real risk-free rate expectations that are reflected in the yields on U.S. Treasury bonds and the prices of common stocks, does it necessarily follow that the inflation and real risk-free rate expectations that are reflected in the yields on U.S. Treasury bills and the prices of common stocks are dissimilar?

A. No. To the contrary, short and long-term inflation and real risk-free rate expectations, including those that are reflected in the yields on U.S. Treasury bills, U.S. Treasury bonds, and the prices of common stocks, should equal over time.

[16] In October 2001, the U.S. Treasury suspended the issuance of 30-year U.S. Treasury bonds.

Any other assumption implausibly implies that the real risk-free rate and inflation is expected to systematically and continuously rise or fall.

Although expectations for short and long-term real risk-free rates and inflation should equal over time, in finite time periods, short and long-term expectations may differ. Short-term interest rates tend to be more volatile than long-term interest rates.[17] Consequently, over time U.S. Treasury bill yields are less biased (i.e., more accurate) but less reliable (i.e., more volatile) estimators of the long-term risk-free rate than U.S. Treasury bond yields. In comparison, U.S. Treasury bond yields are more biased (i.e., less accurate) but more reliable (i.e., less volatile) estimators of the long-term risk-free rate. Therefore, an estimator of the long-term nominal risk-free rate should not be chosen mechanistically. Rather, the similarity in current short and long-term nominal risk-free rates should be evaluated. If those risk-free rates are similar, then U.S. Treasury bill yields should be used to measure the long-term nominal risk-free rate. If not, some other proxy or combination of proxies should be used.

Q. What is the current yield on three-month U.S. Treasury bills and the current estimated yield on thirty-year U.S. Treasury bonds?

A. Three-month U.S. Treasury bills are currently yielding 0.96%. The estimated yield for U.S. Treasury bonds equals 5.48%.[18] Both estimates are derived from quotes

[17] Fabozzi and Pollack, ed., *The Handbook of Fixed Income Securities*, Fourth Edition, Irwin, p. 789.

[18] Since the suspension of the 30-year U.S. Treasury bond, the U.S. Treasury publishes a Long-Term Average Rate, which represents the arithmetic average of the bid yields on all outstanding fixed-coupon securities with 25 years or more remaining to maturity. Additionally, the U.S. Treasury publishes daily linear extrapolation factors that can be added to the Long-Term Average Rate to estimate a 30-year rate. www.treas.gov/offices/domestic-finance/debt-management/interest-rate/ltcompositeindex.html

for August 20, 2003.[19] Schedule 4.7 presents the published quotes and effective yields.

Q. Of the U.S. Treasury bill and bond yields, which is currently a better proxy for the long-term risk-free rate?

A. In terms of the gross domestic product ("GDP") price index, the Energy Information Administration ("EIA") forecasts the inflation rate will average 2.5% annually during the 2003-2025 period.[20] In terms of the Consumer Price Index ("CPI"), the EIA forecasts the inflation rate will average 2.9%annually during the 2003-2025 period. In comparison, Global Insight forecasts that the GDP price index inflation will average 2.6% annually while the CPI inflation will average 3.1% annually during the 2003-2027 period.[21] In terms of the CPI, the *Survey of Professional Forecasters* ("*Survey*") forecasts the inflation rate will average 2.5% during the next ten years.[22] In terms of real GDP growth, EIA forecasts the real risk-free rate will average 3.1% during the 2003-2025 period;[23] Global Insight forecasts the real risk-free rate will average 3.0% during the 2003-2027 period;[24] and the *Survey* forecasts the real risk-free rate will average 3.2% during the next ten years.[25] Those forecasts imply a long-term, nominal risk-free rate between 5.7% and 6.2%.[26] Therefore, EIA, Global

[19] The Federal Reserve Board, *Federal Reserve Statistical Release: Selected Interest Rates, H.15 Daily Update*, www.federalreserve.gov/releases/H15/update/, August 21, 2003.

[20] Energy Information Administration, *EIA Annual Energy Outlook*, Table 20, Macroeconomic Indicators, December 2002.

[21] Global Insight, "The U.S. Economy: The 25 Year Focus," Table 15, Fall 2002.

[22] *Survey of Professional Forecasters*, Federal Reserve Bank of Philadelphia, www.phil.frb.org/files/spf/survq203.html, May 20, 2003. The *Survey* aggregates the forecasts of approximately thirty forecasters.

[23] Energy Information Administration, *EIA Annual Energy Outlook*, Table 20, Macroeconomic Indicators, December 2002.

[24] Global Insight, "The U.S. Economy: The 25 Year Focus," Table 1, Winter 2003.

[25] *Survey of Professional Forecasters*, Federal Reserve Bank of Philadelphia, www.phil.frb.org/files/spf/survq103.html, February 24, 2003.

[26] Nominal interest rates are calculated as follows:

Insight, and *Survey* forecasts of inflation and real GDP growth expectations suggest that, currently, the U.S. Treasury bond yield more closely approximates the long-term risk-free rate. It should be noted, however, the U.S. Treasury bond yield is an upwardly biased estimator of the long-term risk-free rate due to the inclusion of an interest rate risk premium associated with its relatively long term to maturity.[27]

Q. Please explain why the real risk-free rate and the GDP growth rate should be similar.

A. Risk-free securities provide a rate of return sufficient to compensate investors for the time value of money, which is a function of production opportunities, time preferences for consumption, and inflation.[28] The real risk-free rate excludes the premium for inflation. The real GDP growth rate measures output of goods and services without reflecting inflation expectations and, as such, also reflects both production and consumers' consumption preferences. Therefore, both the real GDP growth rate and the real risk-free rate of return should be similar since both are a function of production opportunities and consumption preferences without the effects of either a risk premium or an inflation premium.

$$r = (1 + R) \times (1 + i) - 1.$$

where $r \equiv$ nominal interest rate;
$R \equiv$ real interest rate; and
$i \equiv$ inflation rate.

[27] For example, the current long-term government bond yield of 5.48% and the average historic realized horizon premium of 1.5% during the last 32 years (Ibbotson Associates, *Stocks, Bonds, Bills, and Inflation, 2003 Yearbook*, p. 177) imply a risk-free rate of approximately 3.9%.

[28] Brigham and Houston, Fundamentals of Financial Management, 8th edition.

Q. How was the expected rate of return on the market portfolio estimated?

A. The expected rate of return on the market was estimated by conducting a DCF analysis on the firms composing the S&P 500 Index ("S&P 500") as of June 30, 2003. That analysis used dividend information reported in the July 2003 edition of S&P's *Security Owner's Stock Guide* and closing market prices reported by the Chicago Board of Options Exchange on July 1, 2003. Growth rate estimates were obtained from the June 2003 edition of *IBES Monthly Summary Data* and August 7, 2003 Zacks reports. Firms not paying a dividend as of June 30, 2003, or for which neither IBES nor Zacks growth rates were available were eliminated from the analysis. The resulting company-specific estimates of the expected rate of return on common equity were then weighted using market value data from the Chicago Board of Options Exchange on July 1, 2003. The estimated weighted average expected rate of return for the remaining 359 firms, composing 83.76% of the market capitalization of the S&P 500, equals 13.66%.

Q. How did you measure market risk on a security-specific basis?

A. I used the beta coefficient in my risk premium analysis. Beta measures risk in a portfolio context. When multiplied by the market risk premium, a security's beta produces a market risk premium specific to that security. I developed two distinct sample average betas for each of my samples, one based on the Value Line methodology ("Value Line beta") and the other based on the Merrill Lynch methodology ("Regression beta").[29]

[29] The Regression beta methodology is the same as the Merrill Lynch methodology except the Regression beta methodology substitutes (1) total excess return data for the total price change data that the Merrill Lynch methodology uses and (2) the NYSE Composite Index for the S&P500 Index as a proxy for the market return. The former substitution does not significantly affect the beta estimate; however , using the

When available, I used published Value Line beta estimates for each company in each sample.[30] For those companies that did not have published Value Line beta estimates, I calculated beta estimates using the Value Line methodology.[31] Value Line estimates beta for a security with the following model using an ordinary least-squares technique:[32]

$$R_{j,t} = a_j + \beta_j \times R_{m,t} + e_{j,t}$$

where $R_{j,t}$ ≡ the return on security j in period t;

$R_{m,t}$ ≡ the return on the market portfolio in period t;

a_j ≡ the intercept term for security j;

β_j ≡ beta, the measure of market risk for security j; and

$e_{j,t}$ ≡ the residual term in period t for security j.

A beta can be calculated for firms with market-traded common stock. Value Line calculates its betas in two steps. First, the returns of each company are regressed against the returns of the New York Stock Exchange Composite Index ("NYSE Index") to estimate a raw beta. The Value Line regression employs 260 weekly observations of stock price data. Then, an adjusted beta is estimated through the following equation:

NYSE Composite Index as a proxy for the market return produced higher utility betas than using the S&P500 Index.

[30] The Value Line Investment Survey, "Summary and Index," August 15, 2003, pp. 2-17.

[31] The Value Line service to which the Commission subscribes does not provide beta estimates for Artesian Resources, Middlesex Water, Southwest Water, or York Water.

[32] Statman, Meir, "Betas Compared: Merrill Lynch vs. Value Line", *The Journal of Portfolio Management*, Winter 1981.

$$\beta_{adjusted} = 0.35 + 0.67 \times \beta_{raw}.$$

For the Regression beta, I calculated a single beta estimate for each sample with the following model using an ordinary least-squares technique:

$$R_{j,t} - R_{f,t} = \alpha + \beta\,(R_{m,t} - R_{f,t}) + \varepsilon_t$$

where $R_{j,t}$ ≡ the return on security j in period t;

$R_{f,t}$ ≡ the risk-free rate of return in period t;

$R_{m,t}$ ≡ the return on the market portfolio in period t;

α ≡ the intercept term for security j;

β ≡ beta, the measure of market risk for security j; and

ε_t ≡ the residual term in period t for security j.

The Regression beta estimates for the Utility Sample and the Water Sample were calculated in three steps using regression analysis. First, the U.S. Treasury bill return was subtracted from the average percentage change in the sample's stock prices and the percentage change in the NYSE Index to estimate the portfolio's return in excess of the risk-free rate. Second, the excess returns of the two samples were regressed against the excess returns of the NYSE Index to estimate a raw beta. The regression analysis employs 60 monthly observations of stock and U.S. Treasury bill return data. Third, an adjusted beta is estimated through the following equation:

$$\beta_{adjusted} = 0.33743 + 0.66257 \times \beta_{raw}.$$

Q. Why did you adjust the raw beta estimate?

A. I adjusted the raw beta estimate for two reasons. First, betas tend to regress towards the market mean value of 1.0 over time; therefore, the adjustment represents an attempt to estimate a forward-looking beta. Second, empirical tests of the CAPM suggest that the linear relationship between risk, as measured by raw beta, and return is flatter than the CAPM predicts. That is, securities with raw betas less than one tend to realize higher returns than the CAPM predicts. Conversely, securities with raw betas greater than one tend to realize lower returns than the CAPM predicts. Adjusting the raw beta estimate towards the market mean value of 1.0 compensates for the observed flatness in the linear relationship between risk and return.[33]

Q. What are the beta estimates for the Utility Sample and the Water Sample?

A. The average Value Line adjusted beta for the Utility Sample is 0.64. The Regression beta estimate for the Utility Sample is 0.49. The average of those two estimates is 0.57. The average Value Line adjusted beta for the Water Sample is 0.57. The Regression beta estimate for the Water Sample is 0.42. The average of those two estimates is 0.50.

[33] Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980.

Q. What required rates of return on common equity does the risk premium model estimate for the two samples?

A. The risk premium model estimates a required rate of return on common equity of 10.14% for the Utility Sample and 9.57% for the Water Sample. The computation of those estimates appears on Schedule 4.7.

Cost of Equity Recommendation

Q. Based on your entire analysis, what is your estimate of the Company's cost of common equity?

A. A thorough analysis of the required rate of return on common equity requires both the application of financial models and the analyst's informed judgment. An estimate of the required rate of return on common equity based solely on judgment is inappropriate. Nevertheless, because techniques to measure the required rate of return on common equity necessarily employ proxies for investor expectations, judgment remains necessary to evaluate the results of such analyses. Along with DCF and risk premium cost of equity analyses, I have considered the observable 6.69% rate of return the market currently requires on less risky BBB-rated long-term debt.[34] In addition, I have considered the pre-tax interest coverage ratio of 2.38x resulting from my cost of capital and capital structure recommendations. As indicated by the S&P target ranges presented in Table 1 above, a pre-tax interest coverage ratio of 2.38x is consistent with a strong BBB credit rating for a utility with a business profile score of 3. Thus, based on my analysis, in my judgment the investor-required rate of return on common equity for the Company is 9.97%.

[34] The Value Line Investment Survey, Selection & Opinion, August 15, 2003.

Q. Please summarize how you determined the investor-required rate of return on common equity for the Company.

A. An average of the DCF and risk premium estimates for the Utility Sample and the Water Sample yielded a preliminary cost of equity estimate of 9.85%. I adjusted that estimate upward by 12 basis points to reflect the difference in risk between UI and the proxy samples, which produced a final cost of equity estimate of 9.97%. The models from which the individual company estimates were derived are correctly specified and thus contain no source of bias. Moreover, I am unaware of bias in my proxy for investor expectations.[35] In addition, measurement error has been minimized through the use of a sample, since estimates for a sample as a whole are subject to less measurement error than individual company estimates.

Q. Why did you adjust your estimate of the Company's cost of common equity upward from your preliminary estimates for the Utility Sample and the Water Sample?

A. The Utility Sample and the Water Sample serve as proxies for the target company and should therefore reflect the risks of that company. If the proxies do not accurately reflect the risk level of the target company, an adjustment should be made. Therefore, a review of the relative risks of the Utility Sample, the Water Sample, and the Company is necessary. Using information from UI's financial statements and Standard & Poor's *Utility Compustat II* database, I examined and compared the 2000-2002 average Benchmark Ratios of the Company, the Utility Sample, and the Water Sample. Schedule 4.8 presents this information. The Utility Sample's and Water Sample's Benchmark Ratios suggest slightly lower levels of

[35] Except as discussed above in regard to U.S. Treasury bond yields as proxies for the long-term risk-free rate.

risk relative to that of the Company. Those ratios indicate a credit rating of approximately BBB+ for the proxy samples and a strong BBB rating for the Company. Financial theory posits that investors require higher returns to accept greater exposure to risk. Thus, given the difference between the implied credit rating for the Company on those for the Utility Sample and the Water Sample, an small upward adjustment is appropriate.

Q. How did you establish the 12 basis point adjustment used to determine the Company's final cost of equity estimate?

A. The 12 basis point adjustment is based on the spread between long-term utility debt yields rated BBB+ and BBB.[36] In my judgment, 12 basis points is a reasonable level of adjustment, since the Benchmark Ratios indicate a credit rating of approximately BBB+ for the proxy samples and a strong BBB rating for the Company.

Q. Please explain your decision to weight the two samples equally when determining the Company's overall cost of equity.

A. A comparison of the four Benchmark Ratios for the two samples, as shown on Schedule 4.8, indicates that the risk levels of the Utility Sample and the Water Sample were not materially different from each other. Therefore, I concluded that both samples were equally comparable to UI.

[36] Reuters Corporate Spreads for Utilities, www.bondsonline.com, August 21, 2003.

Overall Cost of Capital Recommendation

Q. What is the Company's overall cost of capital?

A. As shown on Schedule 4.1, the Company's overall cost of capital equals 8.49%. That estimate incorporates the midpoint cost of common equity of 9.97%.

Q. Does this conclude your testimony?

A. Yes.

Docket No. 03-0401
ICC Staff Exhibit 4.0
Schedule 4.1

Cherry Hill Water Company

Weighted Average Cost of Capital
December 31, 2002

Company Proposal

	Amount	Percent of Total Capital	Cost	Weighted Cost
Long-term Debt	$115,319,616	59.76%	7.24%	4.33%
Common Equity	$77,650,144	40.24%	10.02%	4.03%
Total Capital	$192,969,760	100.00%		
Weighted Average Cost of Capital				**8.36%**

Staff Proposal

	Amount	Percent of Total Capital	Cost	Weighted Cost
Long-term Debt	$115,472,241	59.79%	7.50%	4.49%
Common Equity	$77,650,144	40.21%	9.97%	4.01%
Total Capital	$193,122,385	100.00%		
Weighted Average Cost of Capital				**8.49%**

Docket No. 03-0401
ICC Staff Exhibit 4.0
Schedule 4.2

Cherry Hill Water Company

Embedded Cost of Long-term Debt
December 31, 2002

	Coupon Rate, Debt Issue Type, (A)	Date Issued (B)	Maturity Date (C)	Original Principal Amount (D)	Face Amount Outstanding (E)	Unamortized Debt Discount or (Premium) (F)	Unamortized Debt Expense (G)	Carrying Value (H)	Coupon Interest Expense (I)	Amortization of Debt Discount or (Premium) (J)	Amortization of Debt Expense (K)	Total Expense (L)
	First Mortgage Bonds											
1	5.41% Collateral Trust Note	30-Aug-02	30-Aug-12	$50,000,000	$50,000,000		$1,291,961	$48,708,039	$2,705,000		$133,588	$2,838,588
2	8.42% Collateral Trust Note	15-Jun-00	30-Jun-15	41,000,000	41,000,000		881,396	40,118,604	3,452,200		70,489	3,522,689
3	9.16% Collateral Trust Note	15-May-91	30-Apr-06	10,000,000	4,000,000		34,764	3,965,236	366,400		10,435	376,835
4	9.01% Collateral Trust Note	15-Jul-92	30-Nov-07	15,000,000	7,500,000		111,661	7,388,339	675,750		22,705	698,455
5	7.87% Collateral Trust Note	1-Jun-95	1-Jun-05	15,000,000	15,000,000		42,516	14,957,484	1,180,500		17,575	1,198,075
6	8.84% Promissory Note	1-Sep-97	20-Dec-12	100,000	79,424			79,424	7,021			7,021
7	8.60% Promissory Note	1-Sep-97	21-Dec-15	100,000	83,884			83,884	7,214			7,214
8	8.10% Promissory Note	1-Sep-97	15-Nov-15	100,000	84,072			84,072	6,810			6,810
9	8.96% Promissory Note	1-Sep-97	20-Dec-16	100,000	87,159			87,159	7,809			7,809
				$131,400,000	$117,834,539		$2,362,298	$115,472,241	$8,408,704		$254,791	$8,663,496
												7.50%

Source: Company response to Staff Data Request MGM 1.02

Cherry Hill Water Company

Growth Rate Estimates

Utility Sample

Company	Zacks	IBES	Average
AGL Resources, Inc.	6.00%	5.53%	5.77%
Cascade Energy Corp.	N/A	4.00	4.00
Consolidated Edison, Inc.	2.90	3.16	3.03
Energy East Corp.	4.83	5.48	5.16
Laclede Gas Co.	4.00	4.00	4.00
Northwest Natural Gas Co.	4.56	4.67	4.62
NSTAR	4.50	5.60	5.05
NUI Corp.	4.67	2.00	3.34
Piedmont Natural Gas Co.	5.00	5.00	5.00

Water Sample

Company	Zacks	IBES	Average
American States Water Co.	3.00%	3.00%	3.00%
Artesian Resources	8.00	8.00	8.00
California Water Service Group	3.00	3.00	3.00
Middlesex Water Co.	7.00	7.00	7.00
Philadelphia Suburban Corp.	8.42	8.80	8.61
Southwest Water Co.	7.00	9.00	8.00
York Water Co.	7.00	7.00	7.00

Sources: *Zacks Investment Research*, August 20, 2003
Institutional Brokers Estimate System, July 17, 2003

Cherry Hill Water Company

Quarterly Dividends and Stock Prices
as of August 20, 2003

Utility Sample

Company	Current Dividend $D_{0,1}$	$D_{0,2}$	$D_{0,3}$	$D_{0,4}$	Next Dividend Payment Date	Stock Price
AGL Resources, Inc.	$0.270	$0.270	$0.280	$0.280	12/1/2003	$27.73
Cascade Energy Corp.	0.240	0.240	0.240	0.240	11/14/2003	18.55
Consolidated Edison, Inc.	0.555	0.560	0.560	0.560	12/15/2003	39.83
Energy East Corp.	0.240	0.250	0.250	0.250	11/14/2003	21.44
Laclede Gas Co.	0.335	0.335	0.335	0.335	10/1/2003	27.95
Northwest Natural Gas Co.	0.315	0.315	0.315	0.315	11/14/2003	28.86
NSTAR	0.530	0.540	0.540	0.540	11/3/2003	45.32
NUI Corp.	0.245	0.245	0.245	0.245	9/15/2003	15.78
Piedmont Natural Gas Co.	0.400	0.400	0.415	0.415	10/15/2003	38.68

Water Sample

Company	Current Dividend $D_{0,1}$	$D_{0,2}$	$D_{0,3}$	$D_{0,4}$	Next Dividend Payment Date	Stock Price
American States Water Co.	$0.221	$0.221	$0.221	$0.221	12/1/2003	$25.87
Artesian Resources	0.193	0.198	0.198	0.198	11/21/2003	24.80
California Water Service Group	0.280	0.281	0.281	0.281	11/14/2003	26.31
Middlesex Water Co.	0.215	0.215	0.215	0.215	12/1/2003	27.00
Philadelphia Suburban Corp.	0.140	0.140	0.140	0.140	12/1/2003	23.57
Southwest Water Co.	0.053	0.058	0.058	0.058	10/21/2003	14.42
York Water Co.	0.130	0.135	0.135	0.135	10/15/2003	18.01

Sources: biz.yahoo.com
www.conedison.com
www.southwestwater.com
www.wsj.com
Standard & Poor's Utility Compustat II

Cherry Hill Water Company

Expected Quarterly Dividends

Utility Sample

Company	$D_{1,1}$	$D_{1,2}$	$D_{1,3}$	$D_{1,4}$
AGL Resources, Inc.	$0.280	$0.280	$0.296	$0.296
Cascade Energy Corp.	0.250	0.250	0.250	0.250
Consolidated Edison, Inc.	0.560	0.577	0.577	0.577
Energy East Corp.	0.250	0.263	0.263	0.263
Laclede Gas Co.	0.335	0.348	0.348	0.348
Northwest Natural Gas Co.	0.330	0.330	0.330	0.330
NSTAR	0.540	0.567	0.567	0.567
NUI Corp.	0.245	0.253	0.253	0.253
Piedmont Natural Gas Co.	0.415	0.415	0.436	0.436

Water Sample

Company	$D_{1,1}$	$D_{1,2}$	$D_{1,3}$	$D_{1,4}$
American States Water Co.	0.228	0.228	0.228	0.228
Artesian Resources	0.198	0.214	0.214	0.214
California Water Service Group	0.281	0.290	0.290	0.290
Middlesex Water Co.	0.230	0.230	0.230	0.230
Philadelphia Suburban Corp.	0.150	0.150	0.150	0.150
Southwest Water Co.	0.058	0.063	0.063	0.063
York Water Co.	0.135	0.144	0.144	0.144

Sources: Schedules 4.3 and 4.4

Cherry Hill Water Company

DCF Cost of Common Equity Estimates

Utility Sample

Company	Estimate
AGL Resources, Inc.	10.06%
Cascade Energy Corp.	9.58
Consolidated Edison, Inc.	8.94
Energy East Corp.	10.19
Laclede Gas Co.	9.17
Northwest Natural Gas Co.	9.35
NSTAR	10.20
NUI Corp.	10.05
Piedmont Natural Gas Co.	9.59
Average	9.68%

Water Sample

Company	Estimate
American States Water Co.	*
Artesian Resources	11.37%
California Water Service Group	7.36
Middlesex Water Co.	10.38
Philadelphia Suburban Corp.	11.14
Southwest Water Co.	9.71
York Water Co.	10.17
Average	10.02%

* American States Water Co.'s 6.50% DCF estimate was excluded from the Water Sample average because it was extremely low in relation to the remaining estimates and to current utility bond rates.

Cherry Hill Water Company

Interest Rates as of August 20, 2003

U.S. Treasury Bills[1]		U.S. Treasury Bonds[2]	
Discount Rate	Effective Yield	Bond Equivalent Yield	Effective Yield
0.94%	0.96%	5.41%	5.48%

Risk Premium Cost of Equity Estimates

Utility Sample

Risk-Free Rate Proxy	Risk-Free Rate		Beta		Risk Premium		Cost of Common Equity
U.S. Treasury Bonds	5.48%	+	0.57	×	(13.66% – 5.48%)	=	10.14%

Water Sample

Risk-Free Rate Proxy	Risk-Free Rate		Beta		Risk Premium		Cost of Common Equity
U.S. Treasury Bonds	5.48%	+	0.50	×	(13.66% – 5.48%)	=	9.57%

[1] U.S. Treasury bill yields are quoted on a 360 day discount basis. The effective yield is determined as follows:

$$Effective\ yield = \left(1 + \frac{discount\ rate \times \left(\frac{days\ to\ maturity}{360} \right)}{1 - discount\ rate \times \left(\frac{days\ to\ maturity}{360} \right)} \right)^{\left(\frac{365}{days\ to\ maturity} \right)} - 1$$

[2] The bond equivalent yield on U.S. Treasury bonds represents a nominal rather than an effective yield. The effective yield is calculated as follows:

$$Effective\ yield = [1 + (bond\ equivalent\ yield \div 2)]^2 - 1.$$

Cherry Hill Water Company

Benchmark Ratios

Utilities, Inc.

Ratio	Value	
	2002	3-yr Avg. 1998-2000
Funds Flow from Operations to Total Debt	12.7%	14.2%
Funds Flow from Operations Interest Coverage	2.9X	3.0X
Pretax Interest Coverage	2.3X	2.8X
Total Debt to Total Capital	60.3%	56.4%

Utility Sample

Ratio	Value	
	2002	3-yr Avg. 1998-2000
Funds Flow from Operations to Total Debt	18.6%	18.2%
Funds Flow from Operations Interest Coverage	3.8X	3.6X
Pretax Interest Coverage	2.6X	2.9X
Total Debt to Total Capital	58.9%	57.8%

Water Sample

Ratio	Value	
	2000	3-yr Avg. 1998-2000
Funds Flow from Operations to Total Debt	15.8%	16.7%
Funds Flow from Operations Interest Coverage	3.5X	3.3X
Pretax Interest Coverage	3.0X	2.9X
Total Debt to Total Capital	56.4%	55.8%

Source: Response to Staff data request MGM 1.04
Standard & Poor's Utility Compustat II